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Mammoth Cave,
Kentucky.

by

Richard, Elsworth Hall

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The Entrance to the Mammoth Cave of Kentucky,

IN KENTUCKY'S MAMMOTH CAVE

BY R. ELLSWORTH CALL, PH. D.

FIRST among the caverns of the earth the Mammoth Cave has long attracted those who love the marvelous and the unique. It has appealed to their sense of the beautiful; to their love of the strange and wonderful; to their powers of imagination. The impressions which casual visitors and long-time students have gained have produced a great mass of literature the titles of which, both books and pamphlets, now make a list which nearly numbers four hundred. Of these most are the results of hasty visits, others of borrowed material revised and not always well authenticated; others still are the result of gleanings by those who have never seen more than a moiety of the wonders which this great underground region has in store.

In the early part of the present century a hunter by name of Hutchins, or

Houchuns, gave through an accident of the chase the first information of the great cave. In pursuit of a wounded bear which, hard pressed, took refuge in the entrance, then nearly filled with the debris of the primitive forests, he found the cavern. How far he ventured within its forever open mouth, what he thought as the great, gloomy hall became more clearly outlined in the uncertain blaze of his pine knot torch, will remain alike unknown. Whether the Hutchins of tradition ever lived is now unknown. No trace of the family name remains in that part of Kentucky. It is certain only that the cave was discovered. Its original finder made haste to tell of his discovery and soon the local world was talking of the great wonder.

The finding of this cavern had more than a passing significance. In 1809,

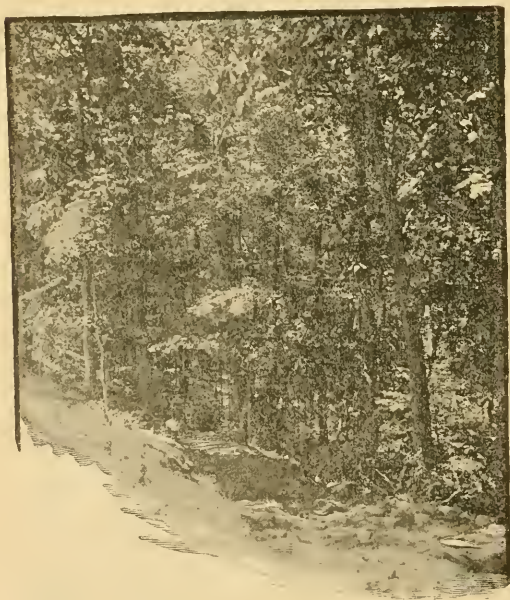
when the cavern was made known, gunpowder was almost worth its weight in gold in Kentucky. Far away from the great centres of civilization that necessary part of the back-woodman's paraphernalia was hard to procure and was treasured carefully when obtained. Several years previously, in 1805 and 1806, a roving Philadelphia chemist had investigated the nitre bearing caves in the vicinity of Lexington, then the Kentucky metropolis. As Latinus first taught the Latins agriculture so Doctor Samuel Brown first taught the early Kentuckians the value of nitre bearing soils and the process of gunpowder manufacture. Caves, over-hanging cliffs, shelving rocks, were alike examined and the loose debris on their bottoms or faces was examined for lime nitrate to use as the basis of the manufacture of saltpetre. A great industry was soon inaugurated in Kentucky, made more generally useful till by the embargo which the war of 1812-14 put on our foreign commerce, and cave-hunting for this purpose became more than a pastime. Every open hole was entered; every suitable location exploited. Mammoth



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Lover's Leap.

Cave was visited with this purpose in view and vast quantities of soil, charged with lime nitrate were found. Soon Philadelphia and Lexington capitalists controlled the cavern and its exploitation went on with a view to securing its great mineral content. Every accessible part of the cave was soon visited and from the miners came wonderful stories of extent and beauties; nor were these accounts entirely free from the incidents which vivid imaginations sometimes give to unusual places. Occasional vague accounts, agreeing only in the statements as to the great extent of the cavern, soon found their way into the eastern press and the great cavern was a fact of history. But not yet of science. More than a quarter century passed before any scientific account of the cavern was prepared; and this was not unmixd with the improper use of the imagination in science. About the year 1840 marks the time of the first fairly accurate account of the scientific aspect of Mammoth Cave.

The history of the various maps of this cavern would prove interest-



The Path leading up to the entrance of the Cave.

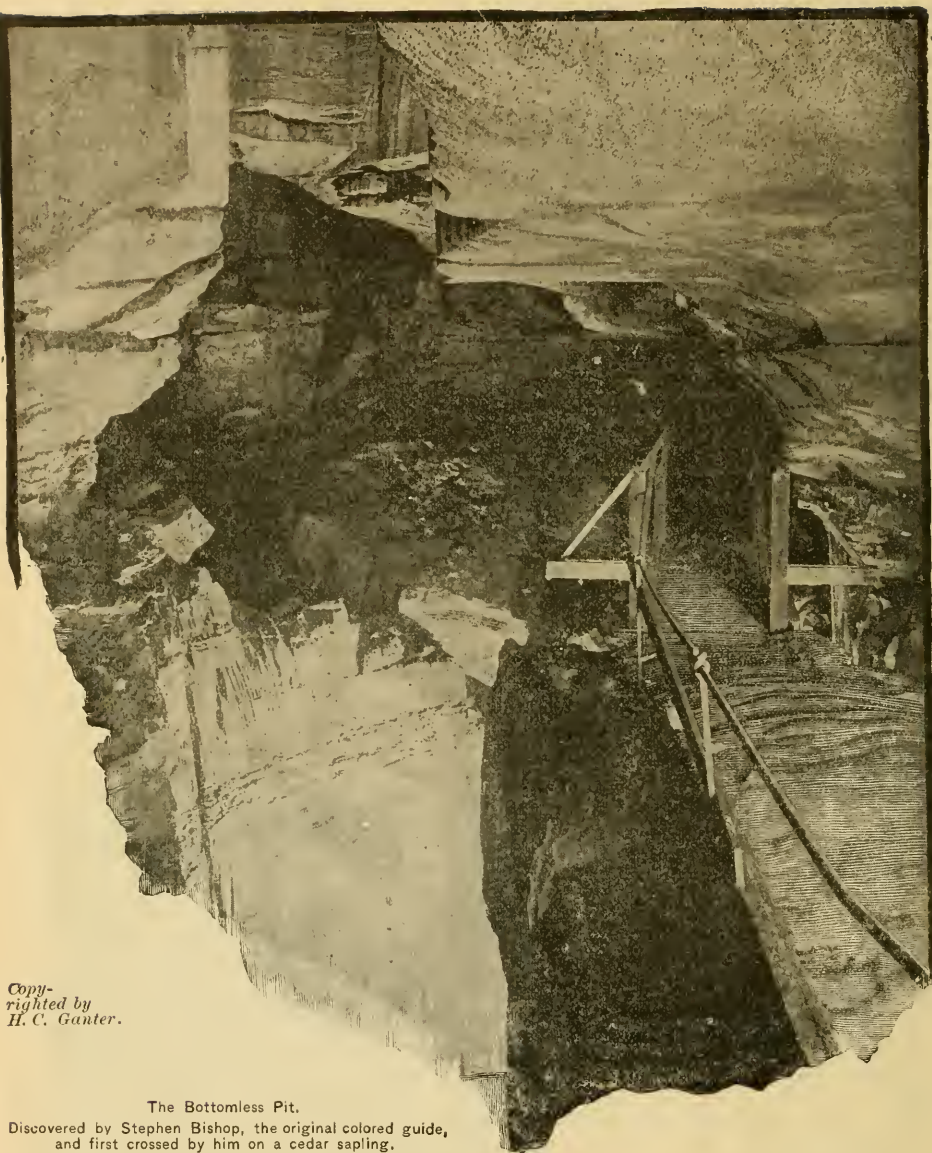
ing reading to the antiquarian. They begin in 1814, with a brief and inaccurate sketch map, by a certain Mr. Bogert, followed two years later by the impossible map of Doctor Ward, in the *Worcester Spy*, and by various modifications of these in the magazine literature of the period. The first and only published instrumental survey, presented in map form from the time of discovery to the present date, was Lee's map, made in 1835. Neither compass nor chain have been employed in any other survey and all others are largely products of a rather lively imagination. Distances and areas are often misstated; something in the crude methods of illumination gives on magnified ideas of dimensions. The exact truth is sufficiently wonderful and no one who has seen any part of its labyrinthine wanderings, its grand halls, its marvellous rivers, its abysmal pits, in vaulted domes, wishes for statements other than facts.

The visitor to Mammoth Cave reaches it after a most pleasant ride over the wonderful region of west central Kentucky, traversed by the great Louisville and Nashville railroad, whose palatial coaches long since displaced the lumbering stage by which only, formerly, could the cave be visited. Half-way between the metropolitan cities of the twin states of Kentucky and Tennessee the cavern invites all north or south bound travellers to inspect its wonders during a brief period of real rest from the toil of travel. If the traveller be an observing man he will have noted a peculiar feature in the region through which for some time he has been travelling. With infrequent exceptions, and these the very largest streams like the Green and the Barren rivers, the valleys will have no running waters. Neither creek nor brook will greet his eye. Nor will he fail to note the peculiarly broken character of the surface. Here and there a larger pit, or depression, may attract his attention but he will soon discover that he is sweeping across or along the margin of greater depressions, some of which are hundreds of acres in extent. He will see these peculiar places on every hand. As he approaches the vicinity of the cave itself these depressions will become more characteristic of the landscape. He is riding swiftly along in the

very heart of the "sink-hole region" of Kentucky, whose entire country rock is traversed by underground channels; and here and there the surface rocks have tumbled in and the pits and depressions he sees are the indications of caverns without number and without end. Eight thousand square miles of this region are around him. Master of all the other of the hundreds of caves now known in the region grand Mammoth Cave is at last reached, the goal of his journey.

The entrance to the cavern is romantic in the extreme. Garlanded with noble chestnut oaks and tulip-trees, and fringed with graceful vines, among which flashes out the vivid green of ferns, while the damp rocks about and below are covered with the brightest of green liverworts, and in the midst of them all the cavernous opening, descending sheer fifty feet, under arch of rock from which leaps a perennial spring, the outlines of the whole shading off into impenetrable blackness, such is the scene upon which the visitor looks on sudden turn to the right at the base of the hill in which the opening, by freak of nature, is placed. Ideal place this for artist, for lover, for wooer of nature! Primeval forests, brilliant birds, unaccustomed flowers, new emotions! Little wonder is it that some there are who here turn back, forgetful of the wonders below and fain to stay above in the land of flowers and sunshine. Once well within the entrance the new scenes and frequent attractions soon make one forget the upper world so intent does he become on the things about him.

Not far within the avenue which leads to the first great hall, the rotunda, the visitor will pass by a wall of loose rocks, regularly arranged and fringing the pathway on either side. These were thus placed by the miners of 1810 and are the sole monument of an Indian woman and child which here lie buried, on the left, at a spot near Hutchins' Narrows. Few there are who know that this spot is thus honored, for while signs of primitive visitations abound far within the cavern, even to Chief City, in the old cave, no other human remains were ever found in Mammoth Cave. The woman and child have been several times particularly described by early antiquarian writers, but with the descriptions there have been given a num-



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The Bottomless Pit.

Discovered by Stephen Bishop, the original colored guide,
and first crossed by him on a cedar sapling.

ber of statements which have no other basis than the imagination.

At the Rotunda, the first magnificent hall, and with but two or three rivals in the cave, the great work accomplished by the nitrate miners first appears. Huge piles of lixiviated dirt greet the eye on every hand, some untouched during all the four score years which have passed since first they were heaped from the

vats. These testify to a work of patriotism that we had well-nigh forgotten; had it not been for these dusky toilers in eternal midnight the war of 1812 might have ended quite differently, for us! But on every side are the remains of vats, and pipes, and tanks, and framework, used in the clumsy chemistry of that day. To this place, first of all, was brought the nitre-bearing dirt from Audubon Avenue

the great hall which sweeps away to the right with graceful curve and roof smooth as artificial ceiling. In winter there may here be seen great clusters of bats, in hibernation, hanging head downwards from boss and point. They are here by myriads and make the walls black so thickly do they sometimes gather. For full three fourths of a mile the bottom has been dug over and the loose soil car-

est great hall in the cave, Chief City, now rarely visited by the tourist. But the journey to this immense hall of nearly three acres extent is well worth the toil; while on the way the several more celebrated features may also be seen. The Giant's Coffin, the Star Chamber, the Black Chambers, the Whale, the Cataracts, the Snow Storm, the Salts Gallery, all afford their several attractions and



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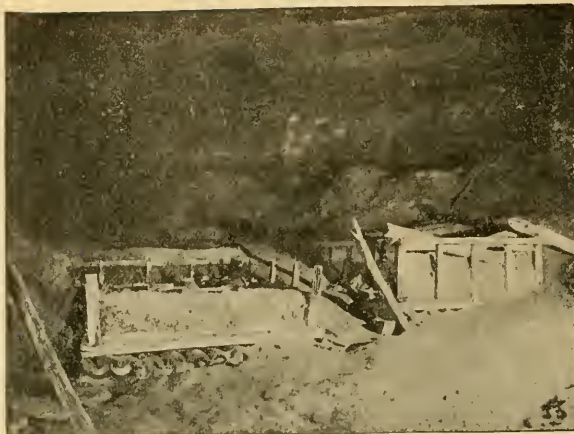
The Bacon Chamber, showing how visitors have made themselves known

ried on the shoulders of brawny slaves to the vats in the Rotunda. At this point, and beyond, the little spring which gave the mimic cataract to the over-springing arch at the entrance, which we saw as we came in, did duty as a solvent for the lime nitrate which this soil contained. Then by pumps it was lifted through the entrance to the outer world to there be made to yield its powder-making treasures to the cause of commerce and independence.

From the Rotunda the Main Cave sweeps on to the left with arch fifty feet overhead and more than that in width. Two and one-half miles away is the larg-

est great hall in the cave, Chief City, now rarely visited by the tourist.

Far different from all other parts of Mammoth Cave the Gothic Avenue has always been attractive to the visitor. In few other places, excepting only the newly opened Olive's Bower, may stalactites be seen. Here they are numerous and some of them very large. Fact and fancy, mythologic lore and historic and biographic reminiscence have alike contributed to their naming. In no portion of the great cavern has caprice in bestowing names been so free as here. The Oak Pillar, Cæsar and Pompey, the Bee Hives, the Bridal Altar, the Arm Chair, are a



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The First Saltpetre Vats used in the early part of the century in the production of Nitrate for Gunpowder.

few of the names suggested by visitors and adopted by guides in past years. This portion of the cave is a rather low avenue, and leads to the Lover's Leap, three-fourths of a mile away, where the Dome Route usually ends. But beyond this point, down the Hill of Difficulty, through the Elbow Crevice, past Jacob's Pit and through Napoleon's Dome under which is Gate-wood's Dining Table, and the visitor enters Gratz Avenue, a tortuous, narrow way which leads to Annette's Dome and Lee's Cisterns. All naturalists who visit the cave should make this trip for in Annette's Dome is Shaler's Brook and in the brook are myriads of small white, blind crustaceans; here also are to be found the snow-white leeches, both rare and blind. Here water actively at work in carving domes and pits may be seen, better perhaps, than in any other portion of the cave. The beautifully fluted and irregular walls, the dome widening below, the rapidly running

brook which leaps from a higher channel midway in the wall, all tell of the work of underground waters in sculpturing; they further testify to the process of solution as that which nature here employs. Gratz Avenue is named for Hyman Gratz, of Philadelphia, who, conjointly with Charles Wilkins, of Lexington, conducted in this cave the manufacture of saltpetre during the troublous times of 1812-1814. It is one of the middle level avenues, the Gothic Avenue, by which it is entered, being at the highest level of the cave, about on a line with the present entrance.

At the Mummy's Niche, in Gothic Avenue, the guides usually recite the fiction of the Indian Mummy of royal blood, said to have been found in Mammoth Cave. Though long since the real facts were made known romance yet permits the tale to the faithful guides from whom old science has taken so much during



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The Entrance to Gothic Avenue.

these later years. The story goes that in the earlier years of the century, while knowledge of the cave was yet but fragmentary, the miners here found, resting in the niche, the mummified body of an Indian girl, which, from the variety of accompanying paraphernalia, their ready imagination clothed with regal place and burial. But the facts are that the mummy came from a neighboring cave, Salt Cave, some few miles away but yet on the Mammoth Cave estate. It was placed here by Gratz and Wilkins, or their manager, for exhibition purposes and kept for some time in Gothic Avenue. It was finally taken to Cincinnati and the east, and after having been exhibited in the Metropolis at length found a resting place in the American Society of Antiquarians Museum, in Worcester. So well did it rest that its very existence was forgotten until a few years since when its whereabouts and history became known and interested persons took it to the World's Columbian Exposition. Thence it was removed to Washington and now has found, let us hope, a final and useful resting place. A recent photograph shows the figure to be that of a woman, buried in

the manner usual to the North American Indian, in sitting posture, with arms folded across her breast. The real facts are none the less interesting than if the mummy had, indeed, been found in Mammoth Cave.

Among the wonderful features of this great cavern, where everything is wonderful, the great domes and pits are not the least. Some of these reach from the base-level of the cave up to, and into, the great subcarboniferous sandstone capping which is characteristic of the region. Beginning as mere fissures these have developed into crevices, and the crevices into vertical channels through which fell the waters that gathered on the surface. Little could have been effected by these, as mere mechanical agents, notwithstanding the great period of time through which they have been in action. But added to the slight mechanical effects were those chemic ones which belong to carbon dioxide in solution. The result in the thousands of years which have elapsed since they began their work is the great number of deep pits and domes. Their bottoms are strewn with masses of rock and finer debris from the sides and

roofs; on these incessantly fall the waters from high overhead, making still deeper these great halls and chambers. Some of these, like the Bottomless Pit, Gorin's Dome, Washington Pit, the Maelstrom, and Mammoth Dome, are well worth careful study. It is impossible to put into cold speech the impressions which one will gather as he stands at the margin or in the bottom of the great chambers. The sides curtained with alabaster, folded and fluted in ten thousand fantastic shapes, here and there a boss of coral which casts weird shadows from his flickering lamp along the vertical walls, the merry din of falling waters or the patter of hesitating drops which make a music unknown in the outer world, all conspire with the eternal gloom to make the place and its surroundings uncanny in the extreme. One hears his heart beat in the great stillness between the falling drops in some, while in others where is the rush of falling



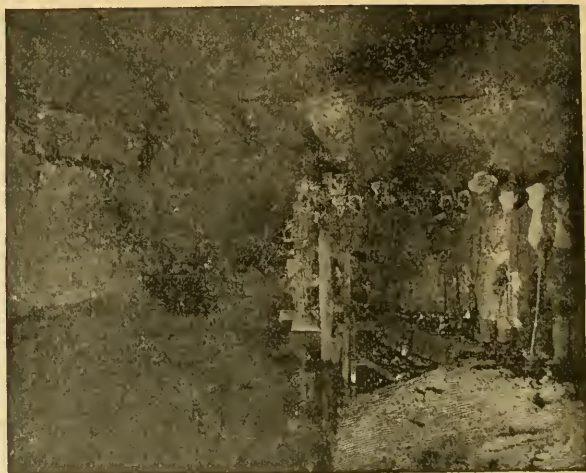
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The Star Chamber.

waters the ears are dinned by the sounds coming to one intensified manyfold from the resonator chambers all about him. No work of art so fixes the mind and so occupies all the attention as these great halls dug out by nature in the very depths of the earth. Alabaster curtains are not to be seen everywhere; they are rare in Mammoth Cave but they are glorious when seen. One wishes to get a peep behind the stony veil in the hope that other secrets of nature may thus be revealed. But, after all, these things which we thought so secret become plain when we make intelligent

questioning. There are no secrets in Mammoth Cave which we may not unravel by persistent effort. Time and intelligence makes all the hidden things of nature to be plain and open.

The Mammoth Dome is probably the finest specimen of excavated hall in the cavern. It is wonderful beyond power of language to express. From bottom to top the height is little over one hundred and fifty feet. But viewed from below in the faint light of the rude lamps employed, or even in the glare of beng'l lights, the top seems much farther above the observer. The distance is apparently increased by the fact that a perspective effect is given the nearly vertical walls because they really approach at the top. Like all other domes in the cavern this one widens below until it becomes a chamber fifty or more feet in width, winding in a sigmoid curve more than one hundred feet horizontally. At the upper and right hand, midheight, great masses of alabaster have formed, while surmounting them are the giant columns, resembling works of human hands, to which the name of Karnak has been happily given. These "ruins" antedate their namesakes on the Nile; they are covered with sheets of pure alabaster which are variously folded and contorted, giving one the impressions of vast curtains extending in fold after fold away into the dim recesses which are but imperfectly illuminated by his lamp. Certainly this locality will recall to one the



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At the Head of Echo River.

impressions of his youth when the folklore tales to which he listened told of wizards and how they turned, by their magic, the homes and persons of others into lasting stone. We wish we could speak the magical words which we feel sure will loose the forms we almost know are rock-cased here:

During frequent visits to Mammoth Cave nothing in it has so deeply impressed us as the famous Echo River. Intimations of its acoustic glories may be had at various points along River Hall, notably near Shakespear's Masque, that wonderful freak in the rocks which puts to blush many a human artist. Certain tones produced here come back to the listener softened and prolonged like music from hidden choirs. But after the first or second arch passed, and the boat ride well begun, then comes to one the full realization of the wonderful symphony which greets him as the result of every sound. The very ripples are musical; the waves send back a grand anthem; the slightest intonation comes back from the hidden recesses a chorus. It would seem that an army of sprites takes up the grosser sounds and remoulds them, makes harmony out of discord and ten thousand chords out of one! Listen to that simple note sent out by the guide whose tuneful lips understand how to frame aright the sound for this great resonator, for such it simply is. It comes back in a thousand separate notes, each one becoming fainter

and still more faint as they roll adown the unknown chambers of this river of night. The darkness about us seems alive with invisible singers; we must be in fairy land indeed! We have enjoyed this experience more than two score times each time it seems as new and wonderful as when its glories first burst on our ear.

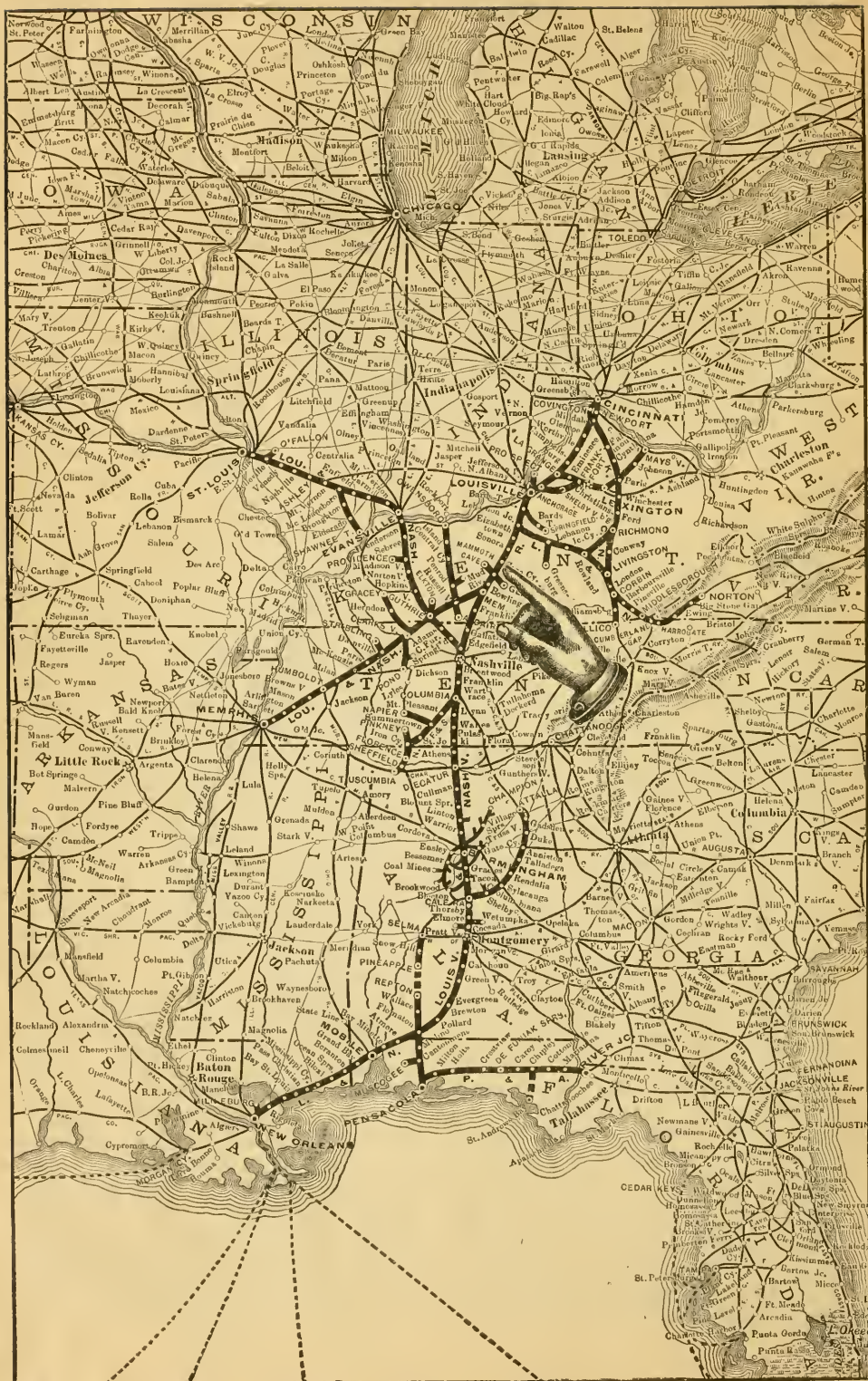
The discovery of the Echo River followed close upon the crossing of the Bottomless Pit by the intrepid Stephen Bishop, the original colored guide who gave us so much of our knowledge of this underground world. A cedar sapling was the sole support which allowed him to cross the great gulf which had held back people for nearly half a century. In the year 1840 he crossed the Pit at the level now taken by the tourist and soon announced the wonders beyond. The great, black stream was beheld by men for the first time. Its waters told no story to these earlier explorers either of life or of chemic work. To them it was only a slowly flowing stream, from night to night. At the end of Purgatory it stood as a menace to all who should attempt to unravel its secrets. To us, even now, the first venture of the frail and rude boat upon its unknown waters without hint of what could be beyond, was little short of reckless. But the voyage was safely made and marvels scarcely to be believed were told of what the low arches hid on the other side. It is over a half century since this voyage was accomplished; the tourist makes it now without once thinking of the gallant slave who took in his hands his life to gratify the curiosity of a master.

Beyond the Echo River the cavern extends nearly three miles presenting many interesting features not to be elsewhere seen. Near the Cascades, in Cascade Hall, are two large avenues neither of which is visited by tourists and in which few persons have ever been. These are Stephenson's Avenue and the Roaring River. The last named is a portion of the Echo River, or a sluggishly flowing branch of it, and is named from the character of its echo. Only at lowest water in very dry seasons can it be with safety explored. It is then but a succession of deep pools and muddy flats, with an occasional cross stream of running water.

These pools are famous haunts for blind fish and for the white cray-fish, also blind. The end of this avenue has never been reached. Stephenson's Avenue has been traversed by us to its end, near Croghan's Hall, but at a much lower level.

After passing through the long, narrow tortuous, avenue called El Ghor, which connects Silliman's Avenue with those sections of the cave in which crystallized gypsum is found in greatest quantity, and after climbing past Mary's Vineyard, Washington Hall is reached where begin these famous crystalline growths which make the marvellous Cleveland's Cabinet. This is a large, rather low, avenue the ceilings and walls of which are completely covered with gypsum "formations" of wonderful intricacy and beauty. From this point on to near the Rocky Mountains either calcite or gypsum crystals abound. They simulate every known form of petal, and are closely crowded like mimic flowers; they spread and turn in plain violation of the laws of gravity. In the Snowball Room they are of fibrous gypsum curling from a center and piling up one on another giving completest impression of a recent schoolboy battle with veritable snowballs, thousands of which still cling to the roof as if but just thrown. The beautiful white masses now and then fall of their own weight; but time grows others to take their places. Some of the "flowers" are as white as snow and quite a foot in diameter, with bract, and petal, and stamen, and pistil as in the real flowers of the upper world. These beautiful poems in stone seem too frail to touch; they make the beauty of the trans-riparian regions.

Our survey ends with Croghan's Hall, where are a few small stalactites and the wonderful Maelstrom, a pit which rivals those we first saw near the entrance. We gaze into its depths; we illumine for a little its inky blackness; we hear the droppings of the mimic waterfall which is yet at work digging the pit deeper still; we wonder where and how those waters again reach the surface, laden with their mineral content. We cannot answer all the questions which will arise and turn to retrace our steps glad we have had at least one view of the underground of Kentucky.



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